

**From:** [Stuble, Bill](#)  
**To:** [Penelope Stamatakis](#)  
**Cc:** [Michael Bisnett](#); ["Solvay - Dolly Potter"](#); [Mulinix, Kari](#)  
**Subject:** RE: SNCR Spec Rev4 Alt1.doc  
**Date:** Thursday, December 04, 2003 10:04:00 AM  
**Attachments:** SNCR Spec Rev4 Alt 1 corr 120403.doc

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Hello Penelope:

Yes, the Rev4 Alt1 furnace (no FGR and no water injection) will have tempering air, and actually a lot more of it in order to maintain the same furnace temperature.

You are right on the % O2 wet basis leaving the furnace. I gave you the calciner offgas O2 by mistake. Leaving the furnace, the offgas O2 will be ~ 12.7% wet basis by my calculation also. Sorry about that confusion and thanks for catching the mistake.

The corrected specification is attached.

-- Bill

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**From:** Penelope Stamatakis [mailto:PStamatakis@fueltechnv.com]  
**Sent:** Wednesday, December 03, 2003 12:29 PM  
**To:** Stuble, Bill  
**Cc:** Michael Bisnett  
**Subject:** RE: SNCR Spec Rev4 Alt1.doc

Bill,

Thank you for the updated combustion unit survey. The lower CO is beneficial to our process, but before I finalize my analysis, I need some clarifications. Under the new condition without FGR, are you still using tempering air? If so, is it the same order of magnitude as in the previous case? Also, I am having trouble matching the excess O2 using 180% excess air. At 180%, I am calculating ~12.7% O2 on a wet basis. I can match the 10.6% O2 wet at 118% excess air, but then the flue gas flow is much lower than what the survey indicates. Is there any way to reconcile these numbers?

Thanks,  
Penelope

-----Original Message-----

**From:** Stuble, Bill [mailto:Bill.Stuble@solvay.com]  
**Sent:** Monday, December 01, 2003 4:53 PM  
**To:** Pstamatakis@fueltechnv.com  
**Cc:** MICHAEL BISNETT; Solvay - Dolly Potter; Mulinix, Kari  
**Subject:** SNCR Spec Rev4 Alt1.doc

Hello Penelope and Michael:

Here is the Fuel Tech Survey Form for Rev 4 Alt 1. Please note the higher excess air, but approximately the same furnace temperature. But, much lower CO in the furnace offgas.

<<Solvay Fuel Tech Survey SNCR 4 page.doc>>

Thanks, Bill

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**From:** Stuble, Bill  
**Sent:** Monday, December 01, 2003 2:05 PM  
**To:** 'Pstamatakis@fueltechnv.com'  
**Cc:** 'MICHAEL BISNETT'; 'Solvay - Dolly Potter'; Mulinix, Kari  
**Subject:** FW: SNCR Spec rev3 co range.doc




Hello Penelope and Michael:

Michael called from Pittsburgh, regarding clarification of Rev 3: << File: SNCR Spec rev3 co range.doc >>

No, there is no other change in the specifications except as stated here (in "SNCR Spec Rev3 co range.doc" attachment). That is, the CO content of the furnace offgas is variable in the range of 500 - 1500 ppm. All other specifications remain the same as given previously. (Please note, those other specifications include the Revisions 1 and 2 that were given previously.)

Meanwhile, I am still working on Rev 4 (SNCR without the benefit of water injection and FGR systems) to make sure the specifications provided are complete. I plan to translate the data in the Rev 4 specifications into your standard data request sheet (SNCR 4 page.doc) to make sure they are complete.

Thanks!

William E. (Bill) Stuble  
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*Rev 4*  
*Alternate 1, Simplified Nox Control, SNCR Only*

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### Firm Quotation

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# 1.0 SCOPE rev 4

In the effort to get the most Nox reduction for the least cost and the least impact on calcined trona production, an Alternate Nox control system is being considered

The alternative Nox control system is specified as follows and a proposal for this Alternate 1 (Rev 4) is desired, if possible:

1. Nox control with SNCR only. Eliminate the FGR and water injection.

A potential problem with FGR is that it increases the volume of gas flow through the furnace, the calciner, and the electrostatic precipitator. Gas velocities go up and residence times go down. It would be ideal if downstream equipment was proportionally sized up to accommodate the extra flow, but that option is not available. The problem with water injection is that it reduces furnace efficiency (15 gpm is 7500 lb/hr of steam).

Furnace conditions would be as follows for SNCR NOx control only, according to the furnace model and material and energy balance, compared with the existing NOx reduction plan:

	Original (Rev 2 and 3) <u>SNCR with FGR and Water Injection</u>	Alternative 1 (Rev 4) <u>SNCR *</u>
Furnace MM Btu/H	200	200
Turndown ratio	2:1	2:1
Furnace temperature deg F	1700 - 1800	1700 - 1800
Furnace excess air, %	75 - 100	180 - 200
Furnace exhaust O2, wet basis	8.0	12.7
Furnace exhaust CO, ppm, norm	550	25
Furnace exhaust CO, ppm, range	500 - 1500	20 - 50
Furnace exhaust ACFM	610,000	590,000
Furnace exhaust lb/hr	429,000	420,000
Coal burned, lb/hr	18,685	18,878
Nox emission w/o SNCR, lb/MM Btu		0.79
Nox emission, w/o SNCR, ppm		308

Everything else stays the same as the original specifications to date.

Also for this Alternate 1, color copies of the model's predictions (3D graphic profiles) of Nox concentration, CO concentration, O2 concentration, and gas temperature are available and can be sent by Fed Ex.

\* This Alternate 1 (as in the original specification) does include Detroit Stoker's Revised Overfire Air Configuration and underthrow fuel distributors, which are upgrades from the original furnaces that last ran in 1995.